



Roll No. _____ (To be filled in by the candidate)

(OLD PATTERN)

Paper Code	2	8	0	3
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Session; 2011-2013

Business Mathematics (Objective Type)

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. If $A = \begin{bmatrix} 5 & 6 \\ 8 & 9 \end{bmatrix}$, then $|A|$ is:

(A) 3

(B) 24

(C) -3

(D) 21

2. 5 in binary number system is:

(A) $(11)_2$ (B) $(101)_2$ (C) $(110)_2$ (D) $(111)_2$

3. Ratio between 6 Kg and 54 Kg is:

(A) 1 : 8

(B) 1 : 3

(C) 1 : 9

(D) 9 : 1

4. 160 is what percentage of 80?

(A) 50%

(B) 200%

(C) 100%

(D) 300%

5. Formula for finding rate is:

(A) $\frac{I \times 100}{P \times r}$ (B) $\frac{I \times 100}{P \times t}$ (C) $\frac{P \times 100}{I \times t}$ (D) $\frac{t \times 100}{P \times I}$

6. Annuity is classified into categories.

(A) 4

(B) 3

(C) 2

(D) 5

7. $f(x) = x + 8$, then value of $f(1)$ is:

(A) 7

(B) 8

(C) -8

(D) 9

8. The degree of equation $2x + 5 = 0$ is:

(A) 0

(B) 1

(C) 2

(D) 3

9. Solution of $(x-4)(x-5) = 0$ is

(A) (4, 5)

(B) (-4, -5)

(C) (-4, 5)

(D) (4, -5)

10. If $A = \begin{bmatrix} 3 & 4 \\ 6 & 9 \end{bmatrix}$, then $AdjA$ is:

(A) $\begin{bmatrix} 9 & -4 \\ -6 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & 6 \\ 4 & 9 \end{bmatrix}$ (C) $\begin{bmatrix} 9 & -4 \\ 6 & 3 \end{bmatrix}$ (D) $\begin{bmatrix} 9 & 4 \\ -6 & 3 \end{bmatrix}$

Roll No. _____ (To be filled in by the candidate)

(OLD PATTREN)

FGS	Paper Code	2	8	0
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Session; 2011-2013

Business Mathematics (Essay Type)

Time: 1:45 Hours

Marks: 40

Section - I

2- Write short answers of any six parts from the following.

2 x 6 = 12

i. Define compound interest.

ii. What is $13\frac{1}{2}\%$ of 98?

iii. Define ordinary annuity.

iv. What is the commission on Rs. 6000 @ $22\frac{1}{2}\%$.

v. Rs. 2500 has to be distributed between the two boys in the ratio 2 : 3. How many Rs does each student receive?

vi. A company has 400 male and 150 female employees. Find the ratio of male employees.

vii. If the simple interest on Rs. 15000/- for 3 years is Rs. 900/-. Find the rate of interest.

viii. If $f(x) = \sqrt{3x-5}$, find $f(x^2)$ and $f\left(\frac{5}{3}\right)$.

ix. Give the domain of the function $f(x) = \frac{2x+1}{x+2}$.

3- Write short answers of any six parts from the following.

2 x 6 = 12

i. Write $\frac{2}{x+1} + \frac{3}{x+2} = 2$ in the quadratic form.

ii. Solve the linear equation $4x - 9 = 0$.

iii. Find two consecutive odd integers whose sum is 16.

iv. Find the sum of $(101)_2$ and $(11)_2$.

v. If $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ find A^2 .

vi. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$, find $|A|$.

vii. Convert 22 into binary number system.

viii. Define a scalar matrix.

ix. Convert $4^{3+x} + 4^{3-x} = 10$ to a quadratic form by suitable substitution.

Section - II

NOTE: Attempt any two questions from the following.

8x2=16

4. (a) Find the cost price if sales price is Rs. 140 and loss is 20%.

(b) Find the amount of an annuity of Rs. 12000/- payable at the end of each year for 10 years at the rate of 5% compounded annually.

5. (a) If $f(x) = \frac{x^2}{x^2+1}$, then find $f(\sqrt{2})$ and $f\left(\frac{1}{\sqrt{2}}\right)$.

(b) Solve $5(x-7) - 2x = 1 - 3[(4x+7) - 2(x-3)]$.

6. (a) If $A = \begin{bmatrix} 4 & 9 \\ 7 & 6 \end{bmatrix}$, then prove that $AA^{-1} = I_2$.

(b) Evaluate $(945)_{10} + (1111)_2$ by changing into binary system.



Roll No. _____ (To be filled in by the candidate)

(NEW PATTERN)

Paper Code

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3

Sessions;2012-2014;2013-2015&2014-2016**Business Mathematics** (Objective Type)**Time: 20 Minutes****Marks: 15**

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. If $A = \begin{bmatrix} 5 & 2 \\ -3 & -5 \end{bmatrix}$ is a matrix of order 2×2 , then $|A| = ?$
 - (A) -19
 - (B) 19
 - (C) -31
 - (D) 31
2. Convert in decimal system to $(1001)_2$.
 - (A) 9
 - (B) 7
 - (C) 5
 - (D) 3
3. Number system used in computer is:
 - (A) decimal
 - (B) binary
 - (C) octal
 - (D) hexadecimal
4. The comparison of two similar quantities is called:
 - (A) Percentage
 - (B) Ratio
 - (C) Proportion
 - (D) Annuity
5. If 2Kg of fruits cost Rs.150/= and 4Kg will cost Rs.300/= is an example of:
 - (A) compound proportion
 - (B) interest
 - (C) inverse proportion
 - (D) direct proportion
6. 20% of 400 is:
 - (A) 200
 - (B) 100
 - (C) 80
 - (D) 800
7. An other term representing principle is:
 - (A) interest
 - (B) capital
 - (C) return
 - (D) price
8. The compound interest for two years at 10% is 4200, the principle is:
 - (A) Rs.5000/=
 - (B) Rs.10,000/=
 - (C) Rs.15000/=
 - (D) Rs.20,000/=
9. If $f(x) = x^2 - 4$ then $f(-2)$ is equal to:
 - (A) 0
 - (B) 4
 - (C) -4
 - (D) 8
10. The origin is:
 - (A) $(0, x)$
 - (B) $(y, 0)$
 - (C) (x, y)
 - (D) $(0, 0)$
11. The solution set of $\sqrt{x} + 3 = 2$ is:
 - (A) $\{ \}$
 - (B) $\{1\}$
 - (C) $\{-1\}$
 - (D) $\{\pm 1\}$
12. Discriminant of quadratic equation $x^2 + 4x - 12 = 0$ is:
 - (A) 60
 - (B) 68
 - (C) 72
 - (D) 64
13. The solution of simultaneous equations $x + y = 6$, $x - y = 2$ is:
 - (A) $x = 5$, $y = 3$
 - (B) $x = 4$, $y = 2$
 - (C) $x = 7$, $y = 1$
 - (D) $x = 8$, $y = 0$
14. If A is a matrix of order 2×3 and B is a matrix of order 3×2 , then order of AB is:
 - (A) 3×3
 - (B) 2×2
 - (C) 2×3
 - (D) 3×2
15. Transpose of row matrix is:
 - (A) row matrix
 - (B) column matrix
 - (C) zero matrix
 - (D) unit matrix

Roll No.

(To be filled in by the candidate)

(NEW PATTERN)

Paper Code

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0

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4

Sessions;2012-2014;2013-2015&2014-2016

Business Mathematics (Essay Type)

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Time: 2:10 Hours

Marks: 60

Section - I

2- Write short answers of any six parts from the following.

2 x 6 =12

i. Divide Rs.6400/= in the ratio 5 : 3.

ii. Find the value of x if $x : 250 :: 4 : 50$.iii. Express $\frac{4}{8}$ as %.

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iv. 250 is 20% of what amount?

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v. What is principal?

vi. Define perpetuity.

vii. A table cost Rs.225/= and is sold Rs.450/=. Find % of gain.

viii. Find simple interest on Rs.5000/= for 10 years at 8% per annum.

ix. Write formula for the amount of an ordinary annuity?

3- Write short answers of any six parts from the following.

2 x 6 =12

i. If $f(x) = x^2 - 1$, find $f\left(\frac{1}{\sqrt{2}}\right)$ and $f(x^2)$.

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ii. Define Domain of a function.

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iii. Prove that $f(x) = 5 - x^2$ is an even function.iv. Solve $3(4x - 2) = 4(2x + 3)$.v. If $\frac{1}{4}$ of an amount is Rs.60/=. what is the amount?vi. Solve $x^2 - 4x + 3 = 0$ by completing the square.vii. Solve $x + 2y = 2$; $4y - x = 10$.viii. Find the discriminant of the equation $x^2 - 5x - 6 = 0$ ix. Express $\frac{x^2}{2} - \frac{x}{6} = \frac{1}{12}$ in standard quadratic form.

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4- Write short answers of any six parts from the following.

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2 x 6 =12

i. What is square matrix?

ii. Define binary number system.

iii. Find A if $2A + \begin{bmatrix} 1 & 2 \\ 4 & 6 \end{bmatrix} = 0$.iv. Find the value of x if $\begin{bmatrix} 2 & x \\ 5 & 10 \end{bmatrix}$ is singular matrix.v. Find the inverse of the matrix $\begin{bmatrix} 4 & -7 \\ 8 & 11 \end{bmatrix}$.vi. Expand the determinant $|C| = \begin{vmatrix} 10 & 5 \\ 5 & \frac{1}{2} \end{vmatrix}$.vii. Find the sum of: $(11)_2$ and $(101)_2$.viii. Convert into decimal base system $(1110)_2$.

ix. Convert 786 into binary number.

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Section - II

NOTE: Answer any three questions from the following.

8x3=24

5. (a) A man saves 10% of his income. If he spends Rs. 15000/=. find his income.

4

(b) What must be the rate of simple interest on Rs. 40,000/= to produce Rs.2000/= in 8 months?

4

6. (a) Compute the compound interest on Rs.500/= for $6\frac{1}{2}$ years at $2\frac{1}{2}\%$ compounded semiannually.

4

(b) If $y = -3x + 5$ find y , when $x = -1, -2, -3, -4$.

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7. (a) Solve for x : $4(2x - 5) = 3(2x + 18)$.(b) Solve $3(x + 1) + x^2 = x^2 + 12$.

4+4=8

8. (a) Find P and q : $\begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix} \begin{bmatrix} p & 2 \\ 7 & q \end{bmatrix} = \begin{bmatrix} 31 & 1 \\ 55 & 3 \end{bmatrix}$

4

(b) Solve by Cramer's rule: $2x - 3y = 1$; $x + 4y = 6$.

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9. (a) Simplify $\{(11101111)_2 \cdot (10001)_2\} - \{(1111000)_2 - (1000)_2\}$

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(b) Evaluate $(101010)_2 \times (111111)_2$.

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Roll No. _____ (To be filled in by the candidate)

Paper Code

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4

1

Sessions;2012-2014;2013-2015&2014-2016

Business Mathematics (Objective Type)

Time: 20 Minutes

Marks: 15

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. The ratio between 80 and 640 is:

(A) 1 : 10

(B) 1 : 8

(C) 1 : 4

(D) 1 : 2

2. If $A : B = 2 : 3$ and $B : C = 3 : 5$ Hence $A : B : C$ would be:

(A) 2 : 3 : 5

(B) 1 : 2 : 3

(C) 1 : 3 : 5

(D) 1 : 2 : 5

3. 10% of 300 is:

(A) 10

(B) 30

(C) 100

(D) 150

4. Principal amount remain constant for calculation of interest for every period in _____

(A) simple interest

(B) compound interest

(C) rent

(D) investment

5. Principal = Rs.5000, interest rate = 10%, period = $\frac{1}{2}$ year, interest = ?

(A) 1000

(B) 500

(C) 250

(D) 100

6. If $f(x) = 2x + 26$, then $f(20)$.

(A) 63

(B) 64

(C) 65

(D) 66

7. If $f(-x) = f(x)$, the function is:

(A) even

(B) odd

(C) linear

(D) quadratic

8. Given that $x + (x + 8) = 20$, then value of x is equal to _____

(A) 4

(B) 6

(C) 8

(D) 10

9. In quadratic equation, the variable has degree _____

(A) 0

(B) 1

(C) 2

(D) none

10. Given $x = y$ and $2x + y = 3$, then solution set is:(A) $\{(1,1)\}$ (B) $\{(1,2)\}$ (C) $\{(2,1)\}$ (D) $\{(2,2)\}$ 11. $\begin{bmatrix} 2 & -1 & 3 & 4 \end{bmatrix}$ is a _____ matrix.

(A) row

(B) column

(C) null

(D) none

12. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is identity matrix of order.

(A) 0 x 0

(B) 1 x 1

(C) 2 x 2

(D) none

13. If $\begin{vmatrix} 3 & 4 \\ 3 & x \end{vmatrix} = 0$, then x is:

(A) 2

(B) 3

(C) 0

(D) 4

14. The number system used in computer.

(A) binary

(B) decimal

(C) English

(D) none

15. convert $(6)_{10}$ into binary number.(A) $(1001)_2$ (B) $(1000)_2$ (C) $(111)_2$ (D) $(110)_2$

Roll No. _____ (To be filled in by the candidate)

Paper Code	6	0	6	4
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Sessions; 2012-2014; 2013-2015 & 2014-2016

Business Mathematics (Essay Type)

Time: 2:10 Hours

Marks: 60

Section - I**2- Write short answers of any six parts from the following.****2 x 6 = 12**

- Write the two uses of ratio.
- What is amount or maturity value?
- Define Annuity.
- A T.V was sold for Rs.4,000 on 5% loss. Find the cost of T.V.
- If the price of 50 shirts is Rs.3652/=. What will be the price of 80 such shirts?
- The cash prize of Rs.5000 has to be distributed between two students in the ratio 2:3. How many does each student receive?
- Find the simple interest on Rs.3000/= at the rate of 8% per year for 5 years?
- All got 900 marks out of 1100 marks. Find his percentage of marks.

ix. How long will it take to earn Rs. 11250/= as simple interest on the deposit of Rs.75000/= at 5% annually?

3- Write short answers of any six parts from the following.**2 x 6 = 12**

- If $f(x) = x^2 + 3$, then find $f(2)$, $f(3)$.
- Define Explicit function with one example.
- Solve $2x^2 - 10x + 5 = 0$.
- Find the domain and range of $f(x) = \frac{1}{x-3}$.
- Express $\frac{1}{x+4} - \frac{1}{x-4} = 4$ in standard form.
- Eight times of a number is 480. What is the number?
- Find two consecutive integers whose sum is 101.
- Find x -intercept and y -intercept of the function $2x + 3y = 5$.
- Write formula of discriminant of the quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$.

4- Write short answers of any six parts from the following.**2 x 6 = 12**

- Define transpose of a matrix.
- If $A = \begin{bmatrix} 1 & 2 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -4 & 5 & 6 \end{bmatrix}$, then find $3A - 2B$.
- Find adjoint of matrix $A = \begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$.
- If $A = \begin{bmatrix} 3 & 1 \\ 2 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 4 & -1 \\ 2 & 3 \end{bmatrix}$, then find BA .
- Find determinant of $A = \begin{bmatrix} -3 & -2 \\ 4 & 5 \end{bmatrix}$.
- Convert $(11111)_2$ to base 10.
- What is the base of binary number system?
- Convert $(1100011)_2$ to base 10.
- Convert $(27)_{10}$ to base two.

Section - II**NOTE: Answer any three questions from the following.****8x3=24**

- A is half as old as B and B is half as old as C. The sum of their ages is 105 years. Find their ages separately. **4**
 - How long will it take for Rs.9800/= amounting to Rs.12650 at 3% p.a. as simple interest? **4**
- Find the compound interest on Rs.2500 invested at 6% per annum, compounded semi-annually for 8 years. **4**
 - If $f(x, y) = 3x\sqrt{y} - 1$ find $f(0, 9)$. **4**
- Solve by quadratic formula $5x^2 - 13x + 6 = 0$. **4**
 - Solve by elimination method $2x + y = 4$; $x - 2y = 7$ **4**
- If $P = \begin{bmatrix} 2 & 1 \\ 3 & 1 \end{bmatrix}$, $Q = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$, $S = \begin{bmatrix} 1 & -2 \\ -6 & 3 \end{bmatrix}$ and $aP + bQ = S$. Find the value of a and b. **4**
 - Solve the system of linear equations by Cramer's rule $3x + 2y = 12$, $x + 5y = 17$. **4**
- Convert 1453 into binary system. **4**
 - Convert $(1001111)_2$ into decimal form. **4**



Roll No. _____ (To be filled in by the candidate)

Paper Code

2

8

0

1

Business Mathematics (Objective Type)

Session; 2015-2017

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

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1. The simplest ratio of 18 to 30 is:

(A) 3 : 4

(B) 3 : 5

(C) 6 : 9

(D) 6 : 7

2. 160 is 20% of what number?

(A) 8000

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(B) 80000

(C) 800

FGSTU (D) 80

3. 30% simple interest on Rs.500 in 2 years is:

(A) Rs.150

(B) Rs.300

(C) Rs.600

(D) Rs.900

4. Type of annuity are:

(A) 5

(B) 4

(C) 3

(D) 2

5. Value of $f(x) = x^2 + 2x + 1$ at $x = 2$ is:

(A) 4

(B) 6

(C) 8

(D) 9

6. If $2x - 5 = 3$ the value of x is:

(A) 9

(B) 6

(C) 4

(D) 16

7. Quadratic equation has at the most:

(A) one root

(B) two roots

(C) three roots

(D) four roots

8. Order of the matrix $\begin{bmatrix} 2 & 3 & 4 \end{bmatrix}$ is:

(A) 3×1

(B) 1×3

(C) 1×1

(D) 3×3

9. If $A = \begin{bmatrix} 5 & -2 \\ 3 & 1 \end{bmatrix}$, then $|A|$ is:

(A) 11

(B) -1

(C) 13

(D) 17

10. 7 in binary number system is:

(A) $(11)_2$

(B) $(101)_2$

FGSTUDY (C) $(110)_2$

(D) $(111)_2$

Roll No. _____ (To be filled in by the candidate)

FGS	Paper Code	2	8	0
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Business Mathematics (Essay Type) Session;2015-2017

Time: 1:45 Hours

Marks: 40

Section - I

2- Write short answers of any six parts from the following.

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2 x 6 =12

- Define ratio.
- Divide 6000 in the ratio 5 : 7.
- Define percentage.
- Calculate 45% of 900.
- Explain simple interest.
- Find domain of $f(x) = \frac{5}{x-2}$.
- Write at least two key points of compound interest.
- If $f(x) = x^2 - x + 5$, whether $f(x)$ is even or odd.

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ix.- If $y = 2x + 1$ find slope and y- intercept.

3- Write short answers of any six parts from the following.

2 x 6 =12

- Define reciprocal equation.
- Define an equation.
- Define irrational equation.
- Define identity matrix.
- If $A = \begin{bmatrix} 1 & 4 \\ 2 & 8 \end{bmatrix}$, then find $|A|$.
- Define inverse of a matrix.
- Find $(11101)_2 + (111)_2$.
- Convert 27 into binary system.
- If seven times a number is 49 find number.

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Section - II

NOTE: Attempt any two questions from the following.

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8x2=16

- If the stay of 10 persons for 14 days in a hotel costs Rs.10,000. Find the cost of stay of 6 persons for 7 days.
 - In what time will Rs.100000 be Rs.197400 at 12% on compound interest?
- If $f(x) = \frac{x}{x+1}$, find $f(-2), f(1), f(-1)$ and $f(2)$.
 - Solve $2^x + 2^{x+6} - 20 = 0$.
- Expand $\begin{vmatrix} 3 & -1 & 4 \\ 2 & 7 & 3 \\ 5 & 1 & 2 \end{vmatrix}$.
 - Simplify $[(100111)_2 + (10101)_2] - (10111)_2$.

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Roll No. _____ (To be filled in by the candidate)

Paper Code	6	6	4	1
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Sessions;2013-2015&2014-2016

Business Mathematics (Objective Type)

Time: 20 Minutes

Marks: 15

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. The ratio between 3Kg and 27 Kg is:

- (A) 1 : 8 (B) 1 : 3 (C) 1 : 9 (D) 2 : 9

2. If $39 : x :: 18 : 6$, then the value of x is:

- (A) 15 (B) 14 (C) 13 (D) 12

3. What percent Rs. 30 is of Rs.300?

- (A) 30% (B) 20% (C) 40% (D) 10%

4. The money borrowed is called:

- (A) amount (B) principal (C) interest (D) future value

5. If Rs.1000 is borrowed for 5 years and paid Rs.1350 @ of:

- (A) 5% (B) 6% (C) 7% (D) 8%

6. Given that $x + 7 = 12$, then x is:

- (A) 3 (B) 4 (C) 5 (D) 19

7. The graph of a linear equation represents.

- (A) triangle (B) circle (C) straight line (D) parabola

8. 8 time a number is 56, what is the number?

- (A) 5 (B) 20 (C) 6 (D) 7

9. Solution of $(x-4)(x-5) = 0$ is:

- (A) (-4, -5) (B) (-4, 5) (C) (4, 5) (D) (4, -5)

10. Degree of a quadratic equation is:

- (A) one (B) two (C) three (D) four

11. If a matrix has 4 rows and n columns, then its order is:

- (A) 4×4 (B) $4 \times n$ (C) $n \times n$ (D) $n \times 4$

12. A matrix $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$ is:

- (A) row matrix (B) square matrix (C) column matrix (D) identity matrix

13. If A is a singular matrix then $|A|$ is:

- (A) positive (B) negative (C) zero (D) one

14. Conversion of 37 into binary number is:

- (A) $(10011)_2$ (B) $(11110)_2$ (C) $(11000)_2$ (D) $(100101)_2$

15. For expressing decimal number to binary number we use operation:

- (A) addition (B) subtraction (C) multiplication (D) division

Roll No. _____ (To be filled in by the candidate)

Sessions;2013-2015&2014-2016

Business Mathematics (Essay Type) FGSTUDY.com

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Time: 2:10 Hours

Marks: 60

Section - I

2- Write short answers of any six parts from the following.

2 x 6 =12

- i. Write two uses of ratio.
- ii. Divide Rs.60,000 in the ratio 5:7.
- iii. What percent of 23000 is Rs.1265?
- iv. Define an interest.
- v. If 5Kg of potatoes cost is Rs.150. How many Kgs of potatoes can be bought for Rs.850.
- vi. Bilal spends on his clothing Rs.560. This is 8% of his monthly income. What is his monthly income?
- vii. What will be invested at 5% (p.a) for 4 years if compound amount will be Rs.14586?
- viii. Write a formula to find accumulated value S of an ordinary simple annuity.

ix. Define annuity due.

3- Write short answers of any six parts from the following.

2 x 6 =12

- i. Find x and y intercepts of $3y + x = 12$.
- ii. If $f(x) = x^2 - 2x + 3$, then find $f(-1)$ and $f(2)$.
- iii. Find x if $\frac{3x}{8} + 5 = 17$.
- iv. Find three consecutive even integers whose sum is 228.
- v. Solve the equation $9^x - 81 = 0$.
- vi. Solve the equation $4x^2 + 4x - 3 = 0$ by factorization.
- vii. Solve the equation $y + \frac{1}{y} = -2$.
- viii. Define a function and give example of an explicit function.
- ix. Solve the pair of simultaneous equations $2x + 3y = 19$; $2x + 5y = 31$.

4- Write short answers of any six parts from the following.

2 x 6 =12

- i. Define symmetric matrix.
- ii. Define binary number system.
- iii. Find A^{-1} if $A = \begin{bmatrix} 8 & 0 \\ 2 & 3 \end{bmatrix}$.
- iv. Find x if $A = \begin{bmatrix} 8 & x \\ 2 & 4 \end{bmatrix}$ is singular matrix.
- v. Change 19 to base 2.
- vi. Evaluate the determinant $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$.
- vii. Convert $(101110)_2$ into a decimal number.
- viii. Simplify $(101)_2 \cdot (11)_2$ and $(101)_2 + (11)_2$.
- ix. Express the system of equations $3x + 2y = 4$; $x - 3y = 5$ in matrix form.

Section - II

NOTE: Answer any three questions from the following.

8x3=24

- 5. (a) Divide Rs.2415 among three brother's Ashraf, Aslam and Akram such that Aslam : Ashraf = 4:5 and Ashraf : Akram = 9:16. 4
- (b) What must be the rate of simple interest on Rs.40,000/- to produce Rs.2000/- in 8 months. 4
- 6. (a) At what rate Rs.1600 amount to Rs.2950 in 10 years compound interest being added quarterly? 4
- (b) Find slope and y-intercept of $8x - 3y = 15$. 4

7. (a) Find x if $\frac{1-8x}{5} + \frac{2+16x}{4} = \frac{7}{2}$.

(b) Solve $4^{1-x} + 4^{1-x} - 10 = 0$.

4 + 4 = 8

8. (a) If $A = \begin{bmatrix} 5 & 4 & 3 \\ 6 & 3 & 1 \\ 8 & 9 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 & 4 \\ 2 & 4 & 5 \\ 3 & 1 & 6 \end{bmatrix}$ find $2A + 4B$.

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4

(b) Solve the equations with the help of matrices $7x - 3y = 3$; $2x + y = 2$.

4

9. (a) Simplify $(1101)_2 \times (11111)_2$.

(b) Change into decimal number $(101111001)_2$.

4+4=8



Roll No. _____ (To be filled in by the candidate)

Paper Code	2	8	0	1
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Business Mathematics Session: 2015-2017 & 2016-2018

(Objective Type)

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. 1. What percentage of 560 is 28?

- (A) 5% (B) 10% (C) 15% (D) 20%

2. $-2:7::x:49$; the missing term be:

- (A) 8 (B) 12 (C) 14 (D) 16

3. Principal amount = 5000 rupees; rate = 10% period = 1 year; profit is:

- (A) 425 rupees (B) 500 rupees (C) 675 rupees (D) 800 rupees

4. The interval between two successive payments of an annuity remain.

- (A) constant (B) variable (C) fixed (D) both A and B

5. The y-co-ordinate of a point is called:

- (A) abscissa (B) ordinate (C) independent of x (D) range of x

6. The graph of $ax^2 + bx + c = 0$ is:

- (A) elliptic (B) parabolic (C) hyperbolic (D) circle

7. The slope intercept form be:

- (A) $y = mx + c$ (B) $\frac{x}{a} + \frac{y}{b} = 1$ (C) $y - y_1 = m(x - x_1)$ (D) $x \cos \alpha + y \sin \alpha = p$

8. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 0 \end{bmatrix}$ then such matrix is called:

- (A) scalar matrix (B) diagonal matrix (C) identity matrix (D) rectangular matrix

9. $(AB)^t =$

- (A) AB (B) $A^t B^t$ (C) $B^t A^t$ (D) $\frac{1}{AB}$

10. $(1011)_2$ in decimal system is:

- (A) 12 (B) 15 (C) 28 (D) 11

Roll No. (To be filled in by the candidate)

Business Mathematics

Session; 2015-2017 & 2016-2018
(Essay Type)

Time: 1:45 Hours

Marks: 40

Section - I

2- Write short answers of any six parts from the following.

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2 x 6 = 12

- Define percentage.
- Define selling price.
- 400 is 10% of what amount?
- Find the value of x if $x:5::13:2$.
- Define ordinary annuity.
- Define sum of an annuity.
- Find principal if simple interest is Rs.20 @5% for 2 years.
- Define revenue function.
- Define independent variable.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- Solve $x^2 - 7x - 13 = 0$ by completing the square.
- Solve $\frac{3x}{8} + 5 = 17$.
- Solve the equations $5x + y = 22$ and $7x - y = 2$.
- Define upper triangular matrix.
- If $A = \begin{bmatrix} 2 & 1 \\ 6 & 3 \end{bmatrix}$, then find A^{-1} .
- Convert $(1101)_2$ into a decimal number.
- If $A = \begin{bmatrix} 3 & -1 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} -2 & 3 \\ -4 & 5 \end{bmatrix}$, then find $(A+B)^t$.
- Simplify $(1111)_2 - (1010)_2$.
- If $\frac{1}{4}$ of an amount is Rs.160. Find the total amount.

Section - II

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NOTE: Attempt any two questions from the following.

8x2=16

- (a) Aslam sold a plot for 900000 and received 2% commission. Find amount received by Aslam.
(b) Find compound interest at end of 5 years Rs.200000 borrowed at 13% compound annually

5. (a) Solve $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$

(b) Convert $5x + 2y = 10$ into intercepts form and identify the intercepts.

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6. (a) If $4x + 7y = 140$ and $3x - 2y = 100$, find x and y by matrix approach.

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(b) Simplify $[(100111)_2 + (10101)_2] - (10111)_2$



Roll No. _____ (To be filled in by the candidate)

Paper Code	6	6	4	5
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Session;2014-2016

Business Mathematics (Objective Type)

Time: 20 Minutes

Marks: 15

DTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1.1. The quadratic equation has equal roots if discriminant is:

- (A) zero (B) not zero (C) negative (D) imaginary

2. Solution of $x + y = 3$, $x - y = 3$ is:

- (A) (0,0) (B) (3,0) (C) (0,3) (D) (3,3)

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3. Identity matrix is also called:

- (A) rectangular matrix (B) zero matrix (C) row matrix (D) unit matrix

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4. If A is singular matrix, then:

- (A) $|A| = 0$ (B) $|A| \neq 0$ (C) $A = 0$ (D) $A \neq 0$

5. If $AX=B$, then

- (A) $X = A^{-1}B$ (B) $X = BA^{-1}$ (C) $X = AB^{-1}$ (D) $X = B^{-1}A$

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6. 7 in binary number system is:

- (A) (110)₂ (B) (111)₂ (C) (101)₂ (D) (1001)₂

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7. (10110)₂ in decimal number system is:

- (A) 20 (B) 22 (C) 24 (D) 26

8. The ratio between 80 and 640 is:

- (A) 1 : 4 (B) 2 : 4 (C) 1 : 8 (D) 4 : 16

9. In proportion two ratios are:

- (A) equal (B) unequal (C) one greater than other (D) None

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10. $\frac{1}{2}$ is what percent of $\frac{1}{4}$?

- (A) 25% (B) 50% (C) 100% (D) 200%

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11. Interest is expressed in:

- (A) wage (B) salary (C) commission (D) rate

12. A sequence of regular fixed periodic payments is:

- (A) series (B) interest (C) annuity (D) profit

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13. The point (+3, -4) lies in quadrant

- (A) I-Quadrant (B) II-Quadrant (C) III-Quadrant (D) IV-Quadrant

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14. If $f(x) = 5$, then function is:

- (A) odd function (B) linear function (C) constant function (D) identity function

15. The solution of $ax - b = 0$ is:

- (A) $\frac{-b}{a}$ (B) $\frac{b}{a}$ (C) $\frac{-a}{b}$ (D) $\frac{a}{b}$

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Roll No. _____ (To be filled in by the candidate)

Session; 2014-2016

Business Mathematics (Essay Type)

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Time: 2:10 Hours

Marks: 60

Section - I

2- Write short answers of any six parts from the following.

2 x 6 = 12

- Define direct proportion.
- Define extremes and means in proportion.
- Find x , if $1 : x :: 15 : 3$.
- 1451 is what percentage of 7255?
- Find 15.7% of 2200.
- Define annuity.
- Write the formula for simple interest.
- At what rate Rs. 7500/= double it in 5 years by simple interest?
- Find the simple interest on Rs. 50,000/= borrowed for 3 years at 7.5%.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- Find the domain of the function $f(x) = \frac{1}{x-1}$.
- If $f(x) = x^2 - 2x - 4$, then find $f(0)$ and $f(-1)$.
- Define even and odd function.
- Solve: $2x + 4 = x + 2$
- Solve: $3(x-9) = 2(x+1) + 4$
- Solve: $2x^2 - 12 = 0$
- Solve the equation $4^x = 8$.
- Find roots of quadratic equation. $x^2 + 5x + 4 = 0$.
- Solve the simultaneous equations $x - 2y = 4$ and $3x + 2y = 8$.

4- Write short answers of any six parts from the following.

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2 x 6 = 12

- Define row matrix.
- Define binary number system.
- If $A = \begin{bmatrix} 4 & 5 \\ 2 & 3 \end{bmatrix}$, then find A^2 .
- If $A = \begin{bmatrix} 0 & 2 \\ 3 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ find AB .
- Convert 17 to binary system.
- Expand $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and find $\text{adj } A$ and $|A|$
- Simplify $(1100)_2 - (111)_2$.
- Convert $(1001)_2$ to base 10.
- What is formula for the inverse of a square matrix A.

Section - II

NOTE: Answer any three questions from the following.

8x3=24

- If 45 dozens of eggs cost Rs. 750/=. How much 8 dozen of eggs cost?
 - How long will it take for Rs. 5000/= to produce Rs. 500/= as simple interest at a rate of 4%?
- At what rate Rs. 5000/= double that in 5 years at compound interest?
 - Write down the equation of straight line having slope $\frac{7}{2}$ and y -intercept 3.

- Solve $2(x+y) - 3(2x-3y) = x+2y$.
 - Solve $x + \frac{1}{x} = 6$.

4 + 4 = 8

- If $A = \begin{bmatrix} 3 & -3 \\ 4 & 1 \end{bmatrix}$, prove that $AA^{-1} = I_2$.

4

- Solve the system of equations $3x + 2y = 5$; $2x - y = 1$ by Cramer's rule.

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4

- Simplify $[(10111011)_2 - (101110)_2] + (10101010)_2$

4+4=8

- Convert $(1111001)_2$ into decimal number system.



Roll No. _____ (To be filled in by the candidate)

Paper Code

2

8

0

5

Sessions; 2015-2017 ; 2016-2018 & 2017-2019

Business Mathematics (Objective Type)

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. 1. A first degree equation is called:

- (A) Linear (B) Non-linear (C) Quadratic (D) Non-quadratic

2. $2x^2 + 3x + 1 = 0$ is a:

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- (A) linear equation (B) Exponential equation (C) cubic equation (D) quadratic equation

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3. A matrix, which has only one column is called:

- (A) column matrix (B) singular matrix (C) square matrix (D) row matrix

4. The determinant of a matrix $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is:

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- (A) zero (B) negative (C) one (D) two

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5. A decimal number system is also called:

- (A) Binary (B) Greek (C) Octal (D) Denary

6. The relation between two homogeneous quantities is called:

- (A) proportion (B) Annuity (C) Ratio (D) percentage

7. What percentage of 560 is 28?

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- (A) 20% (B) 15% (C) 10% (D) 5%

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8. Interest is classified into:

- (A) two classes (B) three classes (C) four classes (D) five classes

9. Monthly installment of a motorcar on lease can be found by using:

- (A) compound interest method (B) simple interest method (C) annuity method (D) proportion method

10. The concept of function was introduced in:

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- (A) 16th century (B) 17th century (C) 18th century (D) 19th century

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Roll No. _____ (To be filled in by the candidate)

Sessions; 2015-2017 ; 2016-2018 & 2017-2019

Business Mathematics (Essay Type)

Time: 1:45 Hours

Marks: 40

Section - I

2- Write short answers of any six parts from the following.

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2 x 6 = 12

- Simplify the ratio $\frac{0.5}{0.06} : \frac{7}{8}$ in reduced form.
- Define quantity discount.
- Prove that $f(x) = x^2 + 4$ is an even function.
- Define annuity due.
- If $f(x) = x^2 - 2x + 1$ then find $f(-1)$ and $f(-2)$.
- 670.8 is what percentage of 13000?
- Write the formula for (a) "compound amount" (b) "compound interest"
- If $x : \frac{1}{4} :: 12 : 3$ then write this in form of equation and find value of x .
- Find simple interest on Rs.5000/= invested for 4 years at the rate 9% annually.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- What is discriminant of $4x^2 - 13x + 3 = 0$.
- Define linear equation.
- Solve $\frac{3x}{8} + 5 = 17$
- Solve $9x^2 = 81$
- If $A = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -3 \\ 4 \end{bmatrix}$, find AB
- Define order of a matrix.
- Define transpose of a matrix.
- Define decimal number system.
- Find $(11011)_2 + (11111)_2$.

Section - II

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NOTE: Attempt any two questions from the following.

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8x2=16

- A T.V set of price 10,000/= is available for sale and discount of Rs.500/= Give the purchase price, also the discount price.
 - In what amount Rs.30,000/= to Rs.42,348 at 9% on compound interest?
- Find the slope and y-intercept of the line. If its equation is $x - y + 4 = 0$.
 - Solve the equation by completing square $3x^2 + 6x - 8 = 0$.
- If $A = \begin{bmatrix} 1 & -1 \\ 0 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 1 \\ 3 & 2 \\ 0 & -1 \end{bmatrix}$ prove that $(AB)^t = B^t A^t$.
 - Evaluate $(1010111)_2 \times (11011)_2$.



Roll No. _____ (To be filled in by the candidate)

(For all sessions)

Paper Code

6

6

4

1

Business Mathematics (Objective Type)

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. 1. What is percentage of 560 is 28?

(A) 20%

(B) 15%

(C) 10%

(D) 5%

2. Total amount is Rs:700000, then commission @ 2% is:

(A) 14,000

(B) 12,000

(C) 10,000

(D) 21,000

3. Compound amount formula is:

(A) $p(1+i)^{-n}$ (B) $p(1-i)^{-n}$ (C) $p(1+i)^n$ (D) $p(1-i)^n$ 4. The set of all values of y is called:

(A) Domain

(B) Range

(C) Co-domain

(D) Power set

5. The degree of quadratic equation is:

(A) one

(B) three

(C) two

(D) four

6. The solution set of $4x^2 + 5x + 1 = 0$ is:(A) $\left\{1, \frac{1}{4}\right\}$ (B) $\{1, 4\}$ (C) $\{-1, -4\}$ (D) $\left\{-1, -\frac{1}{4}\right\}$

7. The horizontal lines of numbers in a matrix are called:

(A) columns

(B) rows

(C) scalars

(D) vectors

8. For two matrices A & B of same orders, $(A+B)^t$ is equal to:(A) $A^t - B^t$ (B) $A^t + B$ (C) $A + B^t$ (D) $A - B$

9. The decimal number system is also called _____ system.

(A) Denary

(B) Binary

(C) Greek

(D) Spanish

10. In decimal system, $(110)_2$ is equal to:

(A) 8

(B) 2

(C) 4

(D) 6

Roll No. _____ (To be filled in by the candidate)

(For all sessions)

Business Mathematics (Essay Type)

Time: 1:45 Hours

Marks: 40

Section - I

2- Write short answers of any six parts from the following.

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2 x 6 = 12

- Define proportion.
- Find the value of "x" if $3:4::x:12$.
- 525 is what percentage of 10,000?
- Express common fraction $\frac{3}{5}$ as percentage.
- Find simple interest on Rs.500 for 4 years at 11% p.a.
- What is meant by annuity?
- Convert $2x - 3y = 6$ into intercepts form.
- If $f(x) = 10x + 5$, find $f(0)$ and $f(1)$.
- Find compound amount when Rs.750 is invested for 8 years at 12% p.a.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- Solve the equation $\frac{9}{x+4} = \frac{5}{x-8}$
- Solve by factorization $x^2 - 7x + 12 = 0$
- Solve the equation by quadratic formula $2x^2 - 3x - 6 = 0$
- Define symmetric matrix.
- Find two consecutive odd integers whose sum is 16.
- If $A = \begin{bmatrix} 2 & 3 \\ 1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 3 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ then find AB.
- If $A = \begin{bmatrix} 4 & -4 \\ -6 & -5 \end{bmatrix}$, then find $|A|$.
- Find the sum of $(10101)_2 + (1101)_2$.
- Convert into binary numbers system, when 49 is decimal number.

Section - II

NOTE: Attempt any two questions from the following.

8x2=16

- A soap factory makes 600 units in 9 days with the help of 20 machines. How many units be made in 12 days with the help of 18 machines?
 - How long will it take to earn Rs.15000 simple interest on a deposit of Rs.750000 at the rate of 10% annually?
- If $f(x) = 2x^2 - 1$ then find $f(0)$, $f(-2)$, $f(\sqrt{3})$, $f(4)$.
 - Solve the equation by completing the square $3x^2 - 2x = 12$.
- Using Cramer's Rule solve the following system of linear equations:

$$\begin{matrix} 2x - 3y = 1 \\ x + 4y = 6 \end{matrix}$$
 - Evaluate $(1111)_2 \times (1001)_2$.

Roll No. _____ (To be filled in by the candidate)

(For all sessions)

Paper Code	6	6	4	7
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Business Mathematics (Objective Type)

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. $x + (x + 8) = 20$, then the value of x is:

- (A) 4 (B) 6 (C) 8 (D) 10

2. A quadratic equation is also called:

- (A) Second degree equation (B) Third degree equation
(C) Linear equation (D) Homogeneous equation

3. Decimal form of $(101)_2$ is:

- (A) 2 (B) 3 (C) 4 (D) 5

4. Binary number system is based on digits:

- (A) 0 to 9 (B) 0 to 5 (C) 0 to 8 (D) 0 to 1

5. If $A = \begin{bmatrix} 1 & 2 \\ 3 & 8 \end{bmatrix}$ then $|A|$ is equals to:

- (A) -2 (B) 2 (C) 3 (D) 4

6. If $A = \begin{bmatrix} 3 & 3 \\ 4 & 5 \end{bmatrix}$ then A^t equals to:

- (A) $\begin{bmatrix} 3 & 5 \\ 4 & 3 \end{bmatrix}$ (B) $\begin{bmatrix} 3 & 3 \\ 4 & 2 \end{bmatrix}$ (C) $\begin{bmatrix} 3 & 4 \\ 3 & 5 \end{bmatrix}$ (D) $\begin{bmatrix} 2 & 4 \\ 3 & 5 \end{bmatrix}$

7. Ratio between 8 Kg and 48 Kg is:

- (A) 1:8 (B) 1:6 (C) 1:9 (D) 1:7

8. If 5% of the amount is Rs. 240, then what is the amount?

- (A) Rs. 2400 (B) Rs. 5000 (C) Rs. 4800 (D) Rs. 4400

9. The simple interest on an investment of Rs. 500 for 4 years at 10% is:

- (A) Rs. 100 (B) Rs. 125 (C) Rs. 150 (D) Rs. 200

10. In a co-ordinate system the point of intersection is called:

- (A) Variable (B) Constant (C) Origin (D) Ordinate

Roll No. _____ To be filled in by the candidate

(For all sessions)

Business Mathematics (Essay Type)

Time: 1:45 Hours

Section-I

Marks: 40

2 x 6 = 12

2- Write short answers of any six parts from the following.

- Simplify the following $25:75:35$.
- Define compound proportion.
- If total price is Rs 4000, rate is 2%. What is amount of commission?
- If principal is Rs. 6000 and rate is 8%. Find amount of interest.
- Define compound interest.
- Solve the equation $2x+8=24$.
- Write the quadratic formula.
- Solve the given equation for x and y, $x+4y=14$ and $3x-2y=7$.
- What is conditional equation?

3- Write short answers of any six parts from the following.

2 x 6 = 12

- Define a function.
- Find the domain of $f(x) = \frac{1}{x-3}$.
- If $A = \begin{bmatrix} 2 & -1 \\ 2 & 1 \end{bmatrix}$ then find A^2 .
- If $A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$ then find $\frac{1}{2}|A|$.
- Convert $(10101)_2$ into Decimal Base System.
- Find B if $3B + \begin{bmatrix} 2 & 5 \\ 4 & 7 \end{bmatrix} = 0$.
- Convert '21' in the binary number system.
- Find the sum of $(10101)_2$ and $(1101)_2$.
- If $A = \begin{bmatrix} -2 & 6 \\ 4 & 7 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$ then find $A+B$ and $A-B$.

Section - II

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8x2=16

NOTE: Attempt any two questions from the following.

- If 20 men can prepare 10 office tables in a day, how many men are required to prepare 25 such office tables in a day?
 - Rs. 3000 amounts to Rs.5843.70 in 17 years compounded annually, what is the interest rate?
- Find the solution set of $x^2-6x-7=0$ by using Quadratic Formula.
 - Find the equation of straight line if it is perpendicular to line with slope -6 and its y-intercept is $\frac{4}{3}$.
- Solve by using Crammer's rule:

$$\begin{matrix} 5x-2y=8 \\ 3x+y=-4 \end{matrix}$$
 - Evaluate $(1111)_2 \times (111) - (1011)_2$.



Roll No. _____ to be filled in by the candidate

(For All Sessions)

Paper Code	6	6	4	1
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Business Mathematics (Objective Type)

Time: 15 Minutes

Marks: 10

NOTE: Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with marker or pen ink on the answer sheet provided.

- 1.1. The ratio between 3Kg and 27Kg is:
(A) 1:8 (B) 1:3 (C) 1:9 (D) 2:9
2. 10% of 50 is:
(A) 20 (B) 15 (C) 10 (D) 5
3. Interest is classified in:
(A) Two classes (B) Three classes (C) Four classes (D) Five classes
4. The point $(-a, -b)$ lies in the quadrant:
(A) First (B) Second (C) Third (D) Fourth
5. 8 times of a number is 56 what is number?
(A) 6 (B) 7 (C) 8 (D) 9
6. The quadratic equation $x^2 + 4x + 3 = 0$ can be factorized as:
(A) $(x+1)(x+3)$ (B) $(x-1)(x-3)$ (C) $(x-1)(x+3)$ (D) $(x+1)(x-3)$
7. Conversion of 7 into a binary system is:
(A) $(11)_2$ (B) $(100)_2$ (C) $(101)_2$ (D) $(111)_2$
8. The decimal number of $(1001)_2$ is:
(A) 7 (B) 9 (C) 11 (D) 13
9. A matrix A is said to be skew symmetric if:
(A) $A' = A$ (B) $A' = -A$ (C) $A' = |A|$ (D) $A' = Adj(A)$
10. Transpose of row matrix is:
(A) Column matrix (B) Row matrix (C) Identity matrix (D) Square matrix

Roll No. _____ to be filled in by the candidate

(For All Sessions)

Business Mathematics (Essay Type)

Time: 1:45 Hours

Section - I

Marks:40

2 x 6 = 12

2- Write short answers of any six parts from the following.

- i. Find the ratio of 2 hours to 50 minutes.
- iii. Define percentage with example.
- v. Find the simple interest on Rs. 700 invested for 3 years, at 6% per annum.

vii. Solve the equation $\frac{9}{x+4} = \frac{5}{x-8}$

ix. Solve the equation by factorization. $9x^2 - 6x - 8 = 0$

3- Write short answers of any six parts from the following.

- i. Define even function by giving an example.
- iii. Convert $(1101.011)_2$ into decimal system.
- v. Convert $(32)_{10}$ into binary system.

vii. Find A if $2A + \begin{bmatrix} 1 & 2 \\ 4 & 6 \end{bmatrix} = 0$

ix. Find A^2 if $A = \begin{bmatrix} 5 & 4 \\ 3 & 2 \end{bmatrix}$

ii. Divide Rs. 3600 between A and B in the ratio 3 : 2

iv. Define an ordinary annuity.

vi. Solve for x : $2x + 20 - 5x = x - 6 + 9x$

viii. Define quadratic equation with an example.

2 x 6 = 12

ii. Discuss the nature of the roots of the equation $x^2 - 8x + 15 = 0$

iv. Evaluate $(1001)_2 \times (101)_2$ without converting into decimal system.

vi. If $A = \begin{bmatrix} 3 & 1 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -1 \\ 2 & 3 \end{bmatrix}$ then find BA

viii. Define triangular matrix. Give example of a triangular matrix of order 2.

Section - II

8 x 2 = 16

NOTE: Answer any two questions from the following.

4.(a) A man paid Zakat of Rs. 30,000 at the rate of $2\frac{1}{2}\%$ p.a of his wealth. What is the value of his wealth? 4

(b) If Rs. 55000 are invested at 8% p.a compounded semi-annually for 5 years. Calculate compound interest. 4

5.(a) If $f(x) = \frac{1}{2}x + \frac{4}{5}$, then find $f(0)$, $f\left(\frac{1}{4}\right)$, $f\left(\frac{1}{\sqrt{2}}\right)$, $f(-2)$ 4(b) Draw the graph of function $f(x) = 10 - 3x$ 4

6.(a) Solve the system of equations by using Cramer's Rule. 4

$2x + 5y = 9$

$x + 2y = 4$

(b) Evaluate $[(111011)_2 \times (110001)_2] - (20)_{10}$ 4

Roll No _____ to be filled in by the candidate

(For All Sessions)

Paper Code

6

9

8

8

Business Mathematics (Commerce)
(Objective)

Time: 15 Minutes

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Marks : 10

Note:- Write answers to the questions on the objective answer sheet provided. Four possible answers are given. Which answer you consider correct fill the corresponding circle A,B,C or D in front of each question with marker or ink on the answer sheet provided.

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1.1 If $2x - 3 = x + 4$, then value of x is:

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(A) 5

(E) 7

(C) 1

(D) 4

2. In quadratic equation the highest degree of variable is:

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(A) is 1

(E) is 2

(C) is 3

(D) is 4

3. Conversion of $(7)_{10}$ into binary system is :

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(A) $(110)_2$

(B) $(100)_2$

(C) $(111)_2$

(D) $(101)_2$

4. $(10110)_2$ in decimal number is:

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(A) 20

(B) 22

(C) 24

(D) 26

5. A rectangular array of elements is called:

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(A) is Vector

(B) is Row Matrix

(C) is Columns

(D) is Matrix

6. The determinant Matrix $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is:

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(A) Zero

(B) One

(C) Two

(D) Three

7. The ratio between 3.5 and 7 is:

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(A) 5 : 1

(B) 1 : 5

(C) 1 : 2

(D) 2 : 1

8. 25 % of Rs 500 is:

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(A) 75

(B) 100

(C) 125

(D) 150

9. Loan is Rs 1000/- for 5 years @ 5 % p. a. Simple interest is:

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(A) 200

(B) 250

(C) 300

(D) 350

10. The function $f(x) = \frac{1}{x}$ is not defined as:-

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(A) 1

(B) -1

(C) 0

(D) 2

roll No _____ to be filled in by the candidate

(For All Sessions)

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Business Mathematics (Subjective)**Time: 1:45 Hours****Marks : 40**

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Section - I

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2. Attempt any six parts from the following:-

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(2x6=12)

- (i) Find the ratio between one hour and 30 minutes. FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
- (ii) Find the value of x , if $x : 250 :: 4 : 50$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- (iii) Calculate 5 % of Rs 5000. FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
- (iv) Find the simple interest on Rs 5000 invested for 3 years at 12 % per annum. ایف جی اسٹڈی ڈاٹ کام
- (v) Define compound interest. FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
- (vi) Solve the equation: $9x + 4 = 4x + 29$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- (vii) Find x , if $2x - 7 = 13$ FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
- (viii) Solve the Quadratic equation by factorization: $x^2 - 4x - 32 = 0$ ایف جی اسٹڈی ڈاٹ کام
- (ix) Write down the two methods to solve the quadratic equation. FGSTUDY.COM FGSTUDY.COM

3. Attempt any six parts from the following:-

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(2x6=12)

- (i) If $f(x) = x^2 + 5x - 4$, then find $f(-1)$, $f(1)$ FGSTUDY.COM FGSTUDY.COM
- (ii) Draw the graph of $f(x) = -x + 5$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- (iii) Convert $(11001)_2$ into decimal number system. FGSTUDY.COM FGSTUDY.COM
- (iv) Simplify $(1100)_2 - (111)_2$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- (v) Convert 241 into binary system. FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
- (vi) Find AB if $A = \begin{bmatrix} 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 4 \\ 5 \end{bmatrix}$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- (vii) If $A = \begin{bmatrix} 2 & -3 \\ -7 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 2 & -6 \end{bmatrix}$ Find $(A + B)^t$ FGSTUDY.COM FGSTUDY.COM
- (viii) Find value of x , the matrix $\begin{bmatrix} x & 2 \\ 3 & 4 \end{bmatrix}$ has no inverse? FGSTUDY.COM FGSTUDY.COM
- (ix) Find determinant $\begin{bmatrix} -7 & 5 \\ -2 & 3 \end{bmatrix}$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام

Section - II**Note:- Attempt any two question from the following:-****(8x2=16)**

4. (a) Twenty men complete the construction of bridge in 7 days. How many men are required to complete the construction work in 5 days. FGSTUDY.COM
- (b) If Rs 3000 are invested at 6 % interest compounded semi-annually. What would it amount at the end of 8 years. FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
5. (a) Draw the graph of $4x + 2y = 10$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- (b) Solve $x^2 - 5x + 2 = 0$ by completing square. FGSTUDY.COM FGSTUDY.COM FGSTUDY.COM
6. (a) Solve by using inverse of a matrix
- $5x - 4y = -8$ ایف جی اسٹڈی ڈاٹ کام ایف جی اسٹڈی ڈاٹ کام
- $-3x + 5y = 7$ ایف جی اسٹڈی ڈاٹ کام
- (b) Simplify $\{(10111011)_2 - (101110)_2\} + (1000000)_2$ FGSTUDY.COM

☆☆	Roll No. _____
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HSSC - (Part-I) A / 2024
(For All Sessions)

Paper Code	6	9	8	3
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Business Mathematics (Commerce)

Time: 15 Minutes

Marks : 10

(Objective)

Note:- Write answers to the questions on the objective answer sheet provided. Four possible answers are given. Which answer you consider correct fill the corresponding circle A, B, C or D in front of each question with marker or ink on the answer sheet provided.

MCQS

1.1 A square matrix A is said to be Skew-symmetric if :

- (A) $A^t = A$ (B) $A^t = A^2$ (C) $A^t = 2A$ (D) $A^t = -A$

2. If order of matrix $A = 3 \times 5$, order of matrix $B = 5 \times 4$, then order of $AB =$

- (A) 3×3 (B) 3×4 (C) 5×5 (D) 5×3

3. The decimal number 9 in binary system =

- (A) $(1000)_2$ (B) $(1011)_2$ (C) $(1001)_2$ (D) $(1100)_2$

4. 30 seconds : 5 minutes

- (A) 1 : 10 (B) 6 : 1 (C) 1 : 6 (D) 10 : 1

5. 20% of 9000 is :

- (A) 1500 (B) 2000 (C) 1800 (D) 1900

6. If $11x - 9 = 9x - 3$, then $x =$

- (A) 2 (B) 3 (C) 5 (D) 4

7. Compound interest after n years computed on the principal amount P at the rate of R per annum is :

- (A) $P[(1 + R)^n - 1]$ (B) $P[(1 + R)^n + 1]$ (C) $P[(1 - R)^n + 1]$ (D) $p[(1 + R)^n - 1]$

8. Roots of the quadratic equation $x^2 + 3x + 2 = 0$ are :

- (A) -1, 2 (B) -1, -2 (C) 1, -2 (D) 1, 2

9. $(1111)_2 - (11)_2 =$

- (A) $(10010)_2$ (B) $(11010)_2$ (C) $(10100)_2$ (D) $(11011)_2$

10. The point $(5, -3/2)$ lies in :

- (A) 1st - quadrant (B) 2nd - quadrant (C) 3rd - quadrant (D) 4th - quadrant

Business Mathematics (Subjective)

Time: 1:45 Hours

Marks : 40

Section - I

(2x6=12)

2. Attempt any six parts from the following:-

RWP-24

- (i) Define proportion.
- (ii) Divide 5000 in ratio 2 : 3
- (iii) 600 is 10% of what number?
- (iv) Find simple interest on Rs. 5000 @ 6% for 4 years.
- (v) Define Annuity.
- (vi) Solve $\frac{7x+8}{3x+1} = \frac{5}{3}$
- (vii) Five times of a number is 150. What is the number?
- (viii) Find the sum and product of the quadratic equation $x^2 - 5x + 6 = 0$
- (ix) Solve $x^2 - 5x + 6 = 0$ by factorization.

3. Attempt any six parts from the following:-

(2x6=12)

- (i) If $f(x) = 3x + 9$, find $f\left(\frac{1}{2}\right)$.
- (ii) Sketch the graph of $f(x) = x + 3$
- (iii) Convert $(1101)_2$ into decimal system.
- (iv) Convert 25 into binary system.
- (v) Find the sum of $(1001)_2$ and $(111)_2$.
- (vi) What is transpose of a matrix?
- (vii) Find AB if $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ 4 \end{bmatrix}$.
- (viii) Find value of x , when $\begin{bmatrix} 8 & x \\ 2 & 4 \end{bmatrix}$ is singular matrix.
- (ix) Find the adjoint of matrix $\begin{bmatrix} -1 & -2 \\ 3 & 4 \end{bmatrix}$

Section - II

Note:- Attempt any two question from the following:-

(8x2=16)

4. (a) If 20 men can construct a housing unit in 60 days. How many men are required to construct such housing unit in 48 days.
- (b) Rs 3000 amounts to Rs. 6843.70 in 17 years compounded annually, what is the interest rate?
5. (a) Find x - intercept and y - intercept of $f(x) = 2x - 1$. Also draw the graph of $f(x) = 2x - 1$.
- (b) Solve the equation : $\frac{1}{x} + \frac{1}{x+1} = \frac{2}{x+3}$
6. (a) Solve the system of linear equations by Cramer rule:

$$\begin{aligned} 2x - 3y &= 1 \\ x + 4y &= 6 \end{aligned}$$
- (b) Evaluate: $[(1011)_2 \times (111)_2] - (101)_2$